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## (54) Method and apparatus for forming books

Verfahren und Vorrichtung zum Zusammentragen von Druckschriften

Procédé et dispositif pour constituer des articles imprimés

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## Description

Demographic publishing has become very popular since it allows advertising targeting of a group of subscribers to a particular magazine or like publication who have an enhanced probability of being interested in the advertising provided. In demographic publishing a number of different forms of signatures having specific demographic appeal are printed, each type of form having different demographic appeal than the others. Each subscriber is then sent a form of magazine -- produced utilizing the signature having the specific demographic appeal form -- having demographic information that likely will appeal to that subscriber.

A more recent technique utilized in the printing of magazines and other publications is the personalization and addressing of the magazine as part of the bindery process. Commercially, this is most commonly done with low resolution ink jet technology, because of its speed and non-contact imaging. However such technology is limited in quality and coverage, hence limiting the ability to add a high degree of personalization to magazines or like "book" bound, publications. One alternative that has been used in areas having very low labor costs is to simultaneously image a label placed on a signature with addressing information at the same time the signature is printed with variable data, and then later -- in a manual operation --removing the pressure sensitive adhesive label from the signature and positioning this label manually on the cover of the publication. This technique is only practical where the labor costs are extremely low, however, and also may leave a readily discernible "void" area on the signature at the point at which the pressure sensitive adhesive label has been removed, or require detachment of an entire section of where the label was printed.

EP-A-0439257 describes a method of producing personalized cheque books in which the personalization on an assembled set of cheques is read from the top document and may be used to print an address on the front cover. The coded information may later be used for sorting finished cheque books by post code.

EP-A-0341524 describes a process in which personalized information from one document is read and printed onto another document, such as a credit card, after the two documents have been assembled together.

DE-A-3132765 describes a process in which documents carrying personalized information are assembled with a label or other addressed document and the information and address are scanned to check that they correspond, before mailing.

US-A-3982746 describes an arrangement in which a plurality of continuous strips of paper are superposed and attached together to form a series of booklets in a continuous web. Personalized information such as a name and address is applied to a portion of the web and the web is folded so that the personalized information is used as a mailing address for the booklet.

None of the above patent disclosures produces a selection of books having different demographic appeal.

Accordingly in one aspect the present invention provides a method of forming books each from a cover adapted to receive address information and a plurality of signatures, comprising the steps of automatically:

(a) providing sets of signatures at least first signatures of which bear personalized information,
(b) for each book, reading the personalized information on the first signature thereof,
(c) assembling the first signature with at least a second signature inside a cover to form a book, and
(d) in response to (b) printing address information on the cover of the book,

characterised in that the first signatures are printed in a plurality of different forms, each form having specific demographic appeal different from the demographic appeal of other forms, and in that the method includes correlating the information concerning demographic appeal with address information in a database.

Preferably the method includes assembling in sequence the books with a common postal code address information regardless of the form of first signature, so that the books with common postal codes are printed in sequence with the address information.

In another aspect the invention provides apparatus for automatically forming books each from a cover adapted to receive address information and a plurality of signatures, comprising:

(a) first means including printing means for providing sets of signatures at least first signatures of which bear personalized information,
(b) reading means for reading the personalized information on the first signature of each book,
(c) assembly means for assembling for each book a first signature with at least a second signature inside a cover to form a book,
(d) further printing means for printing in response to (b) address information on the cover of each book,
characterised in that the first means is arranged to provide first signatures printed in a plurality of different forms, each form having specific demographic appeal different from the demographic appeal of other forms, and in that the apparatus includes means for correlating the information concerning demographic appeal with address information in a database.

Preferably the apparatus includes means for assembling in sequence the books with a common postal code address information regardless of the form of first signature, so that the books with common postal codes are printed in sequence with the address information.

The method and apparatus allow for imaging and folding publication signatures at high speed with high quality, integrating the imaged signatures as part of the

normal bindery process, detecting data on the imaged signatures, and using the detected information to access a data base of addressing information and ultimately electronically printing the addressing information on the cover of the publication. The method according to the invention is completely automatic, provides the ability to add a high degree of personalization to traditionally bound publications, and does so in a high quality manner. The method and apparatus according to the invention are particularly useful with ion deposition printing of the personalized information, although other printing techniques can also be utilized. The printing of the address information can be by ink jet printing since the address information, itself, need not be high quality.

In the present specification and claims, the generic term "book" is utilized. This term is intended to encompass magazines, newsletters, and other like types of bound publications. The term "signature" has its normal meaning in the book publishing field.

The two most practical types of personalized printing are OCR characters and bar code, in which case step (b) is practiced by optically scanning. However magnetic printing and detecting can also be utilized.

Embodiments of method and apparatus for forming books will now be described, by way of example only, with reference to the accompanying drawings of which:-

FIGURE 1 is a schematic of exemplary equipment for practicing the method to produce large cut sheets;

FIGURE 2 is a schematic illustrating apparatus for practicing the method where stacks of imaged signatures are fed and merged with conventionally printed signatures, and bound;

FIGURE 3 is a schematic perspective of an exemplary book;

FIGURE 4 is a detail schematic of another form of an exemplary book with a die cut window in the cover for the address area on a signature showing through;

FIGURE 5 is a logic flow chart illustrating the control sequence of an exemplary method utilizing optical scanning with or without addressing with full or limited data base searching; and

FIGURE 6 is a logic flow chart for an imaged address sequence.

Exemplary apparatus for printing and folding signatures for assembly with other signatures to produce books, having covers adapted to receive address information, is illustrated generally by reference numeral 10 in FIGURE 1. Webs W of paper, or like sheet material used to form the book, such as 90.2cms (35.5 inch) width webs, are fed from conventional splicer 11 through conventional tension control/edge guide 12 to the printing apparatus 13. The splicer 11 may comprise a Martin automatic splicer. If a 90.2 cms (35.5 inch) web is used, a plurality of printers 14 are utilized at the printing station 13, e.g. four staggered, but overlapped, printers 14.

Non-variable information that is provided on the web W preferably is printed thereon before it is provided to the apparatus 10, although under some circumstances it could be printed, along with the variable information, by the printing station 13.

Preferably, the printers 14 are ion deposition printers, such as the MIDAX printers of Moore Business Forms, Inc. or like Delphax ion deposition printers. Such printers apply toner to the web W during printing to produce very high quality, optically scannable (detectable) indicia. The printers 14 are controlled by a conventional computer control 15, such as an A. M. Harris Electropress, a Kodak Diconix Multiplex, or a proprietary system of Moore Business Forms, Inc. known as the XL Data System. From the printer 13, the web W passes to a sheeting apparatus 16 (such as an Egan sheeter), and the individual sheets S produced thereby are fed to a conventional buckle folder 17. The individual sheets S are personalized signatures (e.g. 1/4 signatures, that is having four pages, 1/2 signatures, that is having eight pages, or full signatures, that is having 16 pages).

As an alternative to the system illustrated in FIGURE 1, instead of staggering the printers 14 as illustrated in FIGURE 1, loose loop technology may be utilized passing the web W sequentially to different MIDAX 334, or like, printers.

The buckle folder 17 typically folds the signature S into individual "pages" having a dimension of 22.8 cms (8 7/8 inches) x 28.9 cms (11 3/8 inches), which will ultimately be trimmed -- as described hereafter -- to 21.6 x 27.9 cms (8 1/2 x 11 inch) sheets. The personalized signatures may be fed from the buckle folder 17 directly to the binding apparatus -- shown generally by reference numeral 19 -- in FIGURE 2, or to a storage area, and from the storage area to the apparatus 19.

The personalized indicia that is printed onto the personalized signatures S by the printing apparatus 13 must be capable of being scanned. For example it must be optically scannable, such as OCR readable printing -- as illustrated schematically at 20 and 21 in FIGURE 3 -- or bar code -- such as illustrated at 22 in FIGURE 3. Alternatively it may be MICR or magnetic stripe data that may be detected by a magnetic reader.

Normally, bar code data is visually unacceptable in the final product, therefore if the bar coding 22 is printed it preferably is printed in a border area 23 of the signature S that will ultimately be trimmed before the final book is produced.

The personalized indicia that is printed may be name information (illustrated by 20 and 22 in FIGURE 3), an ID number, such as a person's social security number, subscriber number, or the like (as illustrated at 21 in FIGURE 3), and/or a photograph 24 of the subscriber/addressee. Entire address information (not shown in FIGURE 3) may also be printed on the personalized signature page 25 illustrated in FIGURE 3, or the complete address information may be stored in a data base and retrieved from the data base after detecting of

any one of the indicia 20-22, 24. A perforation line 26 may be formed in page 25 to provide a return form 27.

The binding apparatus 19 includes a conventional gathering line 28 which receives signatures from feeders 29-31, or the like, and gathers the signatures from feeders 29-31 with a cover fed by the cover feeder 32 (if the cover paper, or other web material, is different in construction than the paper of the signatures), and they are fed to a conventional stitcher 33. Any number of feeders 29-31 may be utilized. Typically only one of the signatures -- that is from one of the feeders 29-31 (e.g. feeder 29) -- will be personalized, and if the personalized signature will be always fed by the same feeder then only one detector is necessary. However in order to provide maximum flexibility, and redundancy, it is preferred that a detector 35 be provided downstream (in the direction 36 of movement along the gathering line 28) of each of the feeders 29-31.

The construction of the detectors 35 will be dependent upon the particular variable, detectable, personalized printing that is provided on the personalized signature S that is to be detected. For example if OCR printing or bar code is printed on the signature S then the detectors 35 will be optical scanners, whereas if MICR or magnetic stripe printing is utilized, the detectors 35 will be magnetic detectors.

Downstream of the stitcher 33 is an intelligent print station 38. This may include an ion deposition printer, but since merely address information is being printed on the cover utilizing the print station 38, preferably it comprises an ink jet printer. The intelligent print station 38 is controlled by a computer control 39, which receives information from the detectors 35, processes it, and then controls the print station 38 to print the appropriate address information on the cover of the book being produced. After printing of the address information on the cover, the book goes to a conventional trimmer 40 -- such as a conventional 3-knife trimmer -- in which the border edges (e.g. a bottom border of 0.47 cms (3/16 inch) as seen at 23 in FIGURE 3, and a like 0.47 cms (3/16 inch) border at the top -- not shown in FIGURE 3) is trimmed, and then the book is fed to a conventional stacker/wrapper 41.

The final book produced is illustrated generally by reference 43 in FIGURE 3, and includes the cover 44, pages from non-personalized signatures, and pages from the personalized signature S, such as the page 25. The personalized information, such as a name 20, ID number 21, bar code 22, or even address information (if provided) on the page 25 is scanned by scanner 35, that information is transmitted to the computer control 39 (which is a matching logic system, such as a Moore proprietary XL Data System, the Kodak Diconix Multiplex, or the A. M. Harris Electropress), and then the address information 45 corresponding to the personalized information is printed on the cover 44. The address information 45 is preferably printed directly on the cover 44, or it may be printed on a pressure sensitive adhesive label 46 which has been pre-applied to the cover 44, or it may be printed on a label 46 which is applied to the cover 44 immediately after printing.

In addition to assembling the personalized signature S with other signatures utilizing the apparatus 19, it may be assembled with other business documents too. For example, it may assembled with a business reply envelope 47 (see FIGURE 3), which will have the advertiser's name printed at the addressee location thereon, and may have the subscriber's name (e.g. 20) on the return address portion thereof. The return form 27 may be detached at perforation 26 and inserted in envelope 47.

FIGURE 4 is a detail view of a part of another exemplary form of a book according to the invention. In this embodiment structures comparable to those in the FIGURE 3 embodiment are shown by the same reference numeral, only with a "'" thereafter.

In the FIGURE 4 embodiment, complete address information 45' about the recipient is automatically printed directly on signature page 25'. The cover 44' has a die cut window 48 automatically formed therein, through which the address information 45' is visible. This allows the address information to be printed only once -- on signature page 25' -- yet provide for proper addressing of the book in situations where the signature page 25' is the second page of the book (or close to the second page if die cut windows are formed in pages intervening between signature page 25' and cover 44').

Instead of the signature address information 45' being printed directly on page 25', it may be provided on a pre-imaged label, like the label 46, which label is automatically placed on the signature page 25' at some point in the process, such as after printing of the signature with variable information, but before assembly with the equipment of FIGURE 2. A machine detectable mark may be provided on signature page 25' at the portion thereof on which the label is to be applied to facilitate automatic application of the label, and label application may be integrated with the equipment of FIGURE 2.

A logic flow chart showing one manner of operation of the apparatus 19 is illustrated in FIGURE 5. The FIGURE 5 embodiment is illustrated assuming use of an optical reader 35, although it would be just as applicable if the reader 35 were a magnetic reader.

The optical variable information, e.g. 20-22, on the personalized signature S is read by an optical reader 35 and is fed to the computer 39, i.e. the "read scanner 1 data" block 50. A decision block 51 looks at the data and determines whether a limited search or full search is to be conducted in the data base. If a limited search is to be conducted, at decision block 52 it is determined whether or not the search will be by zipcode (postal code) or by demographic information. At block 53, limited demographic list information is provided from the demographic list 54, and then at decision block 55 it is determined if the scanned code is in the list. If it is, then the search limited data base block 56 is implemented, utilizing the information from the data base 57, and this information is provided to decision block 58. If it is not it

merges with the main routine just before the stop routine 62.

In the postal code routine, at block 59 limited zipcode list information is provided from the zipcode list 60, and then at decision block 61 it is determined if the scanned code is in the list. If it is, then the routine merges with the demographic routine just before the block 56, and if it is not, it merges with the main routine just before the stop routine 62.

Connected to the "no" decision of the decision block 51 is the "search full data base" block 63, connected to the full data base 64. This is connected to the decision block 58 at which the data is compared. If the data is found, then decision block 65 "More than one signature?" looks at the data. If there is a "yes" decision from block 65, then data is read from additional scanners 35 (e.g. the personalized signature is from feeder 29 so that there are other scanners 35 downstream to check the first scanner 35) at block 66 "Read data from additional scanners/signatures with lag correction". If the data compared at decision block 67 is the same, then there is a return to the main loop, while whereas if it is different it is rejected (to just before the stop routine 62).

With a "no" decision from block 65, or a "same" decision from block 67, the decision block 68 determines whether or not intelligent imaging is to occur. If "yes", then the data to be intelligently imaged is stored at block 69, using temporary storage 70, and ultimately intelligent print station 38 is provided with the data once the book associated with that personalized data reaches the print station 38, whereas with a "no" decision decision block 71 is implemented.

Instead of utilizing the flow chart of FIGURE 5, if the complete address information is printed on the sheet 25, the logic flow chart illustrated in FIGURE 6 is utilized. In this situation, the bit image data is acquired at block 75 from the optical bit image scanner (35), and then elements corresponding to elements 69 through 71 in FIGURE 5 are implemented.

## Claims

1. A method of forming books each from a cover adapted to receive address information and a plurality of signatures, comprising the steps of automatically:

   ~~(a) providing sets of signatures at least first signatures (5) of which bear personalized information (20, 21, 22, 24)~~
   (b) for each book, reading (at 35) the personalized information on the first signature thereof,
   (c) assembling the first signature (from 29) with at least a second signature (from 30, 31) inside a cover (from 32) to form a book, and
   (d) in response to (b) printing (at 38) address information on the cover of the book,

   characterised in that the first signatures are printed in a plurality of different forms, each from having specific demographic appeal different from the demographic appeal of other forms, and in that the method includes
   correlating (at 39) the information concerning demographic appeal with address information in a database (60).

2. A method according to claim 1 characterised in that it includes assembling in sequence the books with a common postal code address information regardless of the form of first signature, so that the books with common postal codes are printed in sequence with the address information.

3. A method as recited in claim 1 or claim 2 wherein for each book step (a) includes printing a bar code and/or OCR characters on the first signature, and step (b) is practiced by optically scanning the bar code and/or OCR characters.

4. A method as recited in any of claims 1 to 3 wherein for each book step (a) includes printing complete mailing address information on the first signature, and step (b) is practiced by optically scanning the complete mailing address information; and wherein step (d) is practiced by temporarily storing the complete address information, and then printing essentially that same information on the cover.

5. A method as recited in any of claims 1 to 3 wherein step (d) is practiced by comparing the personalized printing detected in (b) with information in a database, and withdrawing favorably compared information from the database.

6. A method as recited in any of claims 1 to 5 wherein step (a) includes providing personalized information on the first signatures by applying toner to the signatures.

7. A method as recited in any of claims 1 to 6 wherein step (b) is practiced by optically reading the personalized information.

8. A method as recited in any of claims 1 to 6 wherein ~~step (b) is practiced by magnetically reading the personalized information.~~

9. A method as recited in any of claims 1 to 8 wherein for each book step (a) includes printing the name, photograph, and/or I.D. number of a person corresponding to the address information printed in step (d).

10. A method as recited in any of claims 1 to 9 wherein for each book step (a) includes printing personalized indicia in a border area of the signature, and com-

prising the further step of cutting off the border area after step (d) is practiced.

11. A method as recited in any of claims 1 to 10 wherein step (a) includes printing the personalized information by ion deposition printing, and step (d) is practiced by ink jet printing.

12. Apparatus for automatically forming books each from a cover adapted to receive address information and a plurality of signatures, comprising:

(a) first means (10) including printing means (14) for providing sets of signatures at least first signatures (5) of which bear personalized information (20, 21, 22),
(b) reading means (35) for reading the personalized information on the first signature of each book,
(c) assembly means (33, 36) for assembling for each book a first signature (from 29) with at least a second signature (from 30, 31) inside a cover (from 32) to form a book,
(d) further printing means (38) for printing in response to (b) address information on the cover of each book,

characterised in that the first means is arranged to provide first signatures printed in a plurality of different forms (24, 25), each form having specific demographic appeal different from the demographic appeal of other forms, and in that the apparatus includes
means (39) for correlating the information concerning demographic appeal with address information in a database (60).

13. Apparatus according to claim 12 characterised by means for assembling in sequence the books with a common postal code address information regardless of the form of first signature, so that the books with common postal codes are printed in sequence with the address information.

14. Apparatus as recited in claim 12 or claim 13 wherein said printing means (14) comprises a plurality of staggered ion deposition printers and said further printing means (38) comprises an ink jet printer.

**Patentansprüche**

1. Verfahren zum Zusammentragen von Druckschriften je aus einem Umschlag zur Aufnahme von Adressendaten und einer Vielzahl Signaturen, mit den Arbeitsschritten:

a) automatisches Bereitstellen von Signaturen, von denen wenigstens erste Signaturen (5) kundenbezogene Daten (20, 21, 22, 24) tragen,
b) automatisches Lesen (bei 35) bei jeder Druckschrift der kundenbezogenen Daten auf der ersten Druckschriftsignatur,
c) automatisches Zusammentragen der ersten Signatur (aus 29) mit wenigstens einer zweiten Signatur (aus 30, 31) in einem Umschlag (aus 32) zu einer Druckschrift, und
d) in Abhängigkeit von (b) automatisches Drukken (bei 38) der Adressendaten auf den Umschlag der Druckschrift,

dadurch **gekennzeichnet,** daß
die ersten Signaturen in einer Vielzahl verschiedener Formen gedruckt werden, wobei jede Form einen spezifischen demografischen Appeal besitzt, der vom demografischen Appeal anderer Formen verschieden ist,
und das Verfahren die Korrelation (bei 39) der den demografischen Appeal betreffenden Daten mit Adressendaten in einer Datenbank (60) umfaßt.

2. Verfahren nach Anspruch 1,
dadurch **gekennzeichnet,** daß
es das sequentielle Zusammenstellen der Druckschriften mit Adressendaten einer gemeinsamen Postleitzahl umfaßt, ungeachtet der Form der ersten Signatur, so daß die Druckschriften mit gemeinsamen Postleitzahlen sequentiell mit den Adressendaten bedruckt werden.

3. Verfahren nach Anspruch 1 oder 2, bei dem bei jeder Druckschrift der Arbeitsschritt (a) das Drucken eines Strichcodes und/oder von OCR-Zeichen auf die erste Signatur umfaßt und der Arbeitsschritt (b) durch optisches Abtasten des Strichcodes und/oder der OCR-Zeichen ausgeführt wird.

4. Verfahren nach einem der Ansprüche 1 bis 3, bei dem bei jeder Druckschrift der Arbeitsschritt (a) das Drucken vollständiger Postanschriftdaten auf die erste Signatur umfaßt und der Arbeitsschritt (b) durch optisches Abtasten der vollständigen Postanschriftdaten ausgeführt wird, und bei dem der Arbeitsschritt (d) durch vorübergehendes Speichern der vollständigen Adressendaten und dann durch Drucken im wesentlichen derselben Daten auf den Umschlag ausgeführt wird.

5. Verfahren nach einem der Ansprüche 1 bis 3, bei dem der Arbeitsschritt (d) durch Vergleichen des in (b) ermittelten kundenbezogenen Drucks mit Daten in einer Datenbank und durch Abrufen beim Vergleich zutreffender Daten aus der Datenbank ausgeführt wird.

6. Verfahren nach einem der Ansprüche 1 bis 5, bei dem der Arbeitsschritt (a) das Bereitstellen kundenbezogener Daten auf den ersten Signaturen durch Aufbringen von Toner auf die Signaturen umfaßt.

l'étape (a) comprend l'impression sur le premier cahier d'un code à barres et/ou de caractères pour reconnaissance optique, et l'étape (b) est réalisée par balayage optique du code à barres et/ou des caractères pour reconnaissance optique.

4. Procédé tel que décrit dans l'une quelconque des revendications 1 à 3, dans lequel pour chaque livre, l'étape (a) comprend l'impression sur le premier cahier d'informations d'adresse d'expédition complète, et l'étape (b) est réalisée par balayage optique des informations d'adresse complète ; et dans lequel l'étape (d) est réalisée en mémorisant temporairement l'information d'adresse complète, puis en imprimant essentiellement cette même information sur la couverture.

5. Procédé tel que décrit dans l'une quelconque des revendications 1 à 3, dans lequel l'étape (d) est réalisée en comparant l'impression personnalisée détectée au cours de l'étape (b) avec des informations d'une base de données, et en extrayant de la base de données, les informations ayant donné une comparaison positive.

6. Procédé tel que décrit dans l'une quelconque des revendications 1 à 5, dans lequel l'étape (a) comprend la réalisation d'informations personnalisées sur les premiers cahiers en déposant du toner sur lesdits cahiers.

7. Procédé tel que décrit dans l'une quelconque des revendications 1 à 6, dans lequel l'étape (b) est réalisée en lisant les informations personnalisées par procédé optique.

8. Procédé tel que décrit dans l'une quelconque des revendications 1 à 6, dans lequel l'étape (b) est réalisée en lisant par procédé magnétique les informations personnalisées.

9. Procédé tel que décrit dans l'une quelconque des revendications 1 à 8, dans lequel pour chaque livre, l'étape (a) comprend l'impression du nom, de la photographie, et/ou du numéro d'identification d'une personne correspondant à l'information d'adresse imprimée au cours de l'étape (d).

10. Procédé tel que décrit dans l'une quelconque des revendications 1 à 9, dans lequel pour chaque livre, l'étape (a) comprend l'impression de formules personnalisées dans une zone marginale du cahier, et comprend une étape supplémentaire de découpage et enlèvement de la zone marginale après que l'étape (d) a été réalisée.

11. Procédé tel que décrit dans l'une quelconque des revendications 1 à 10, dans lequel l'étape (a) comprend l'impression des informations personnalisées par déposition d'ions, et l'étape (d) est réalisée par impression par jet d'encre.

12. Appareil pour réaliser automatiquement des livres chacun à partir d'une couverture prévue pour recevoir une adresse et d'une pluralité de cahiers, comprenant :

(a) des premiers moyens (10) comprenant des moyens d'impression (14), pour constituer des jeux de cahiers, dont les premiers cahiers (5) au moins comportent des informations personnalisées (20, 21, 22),
(b) des moyens de lecture (35), pour lire les informations personnalisées du premier cahier de chaque livre,
(c) des moyens d'assemblage (33, 36) pour assembler, pour chaque livre, un premier cahier (provenant de 29) avec au moins un deuxième cahier (provenant de 30, 31), à l'intérieur d'une couverture (provenant de 32), afin de constituer un livre,
(d) d'autres moyens d'impression (38) pour imprimer, en réponse à (b), des informations d'adresse sur la couverture de chaque livre,

ledit appareil étant caractérisé en ce que les premiers moyens sont conçus pour créer des premiers cahiers sous une pluralité de formes différentes (24, 25), chaque forme ciblant une catégorie de population différente des catégories ciblées par d'autres formes,

et en ce que l'appareil comprend des moyens (39) permettant de mettre en corrélation les informations concernant la population ciblée avec les informations d'adresse, dans une banque de données (60).

13. Appareil selon la revendication 12, caractérisé en ce qu'il comprend des moyens pour assembler de manière séquentielle les livres dont l'information d'adresse comporte le même code postal, quelle que soit la forme du premier cahier, de sorte que les livres comportant le même code postal sont imprimés de manière séquentielle avec les informations d'adresse.

14. Appareil tel que décrit dans la revendication 12 ou la revendication 13, dans lequel lesdits moyens d'impression (14) comprennent une pluralité d'imprimantes à déposition d'ions décalées, et lesdits autres moyens d'impression (38) comprennent une imprimante à jet d'encre.

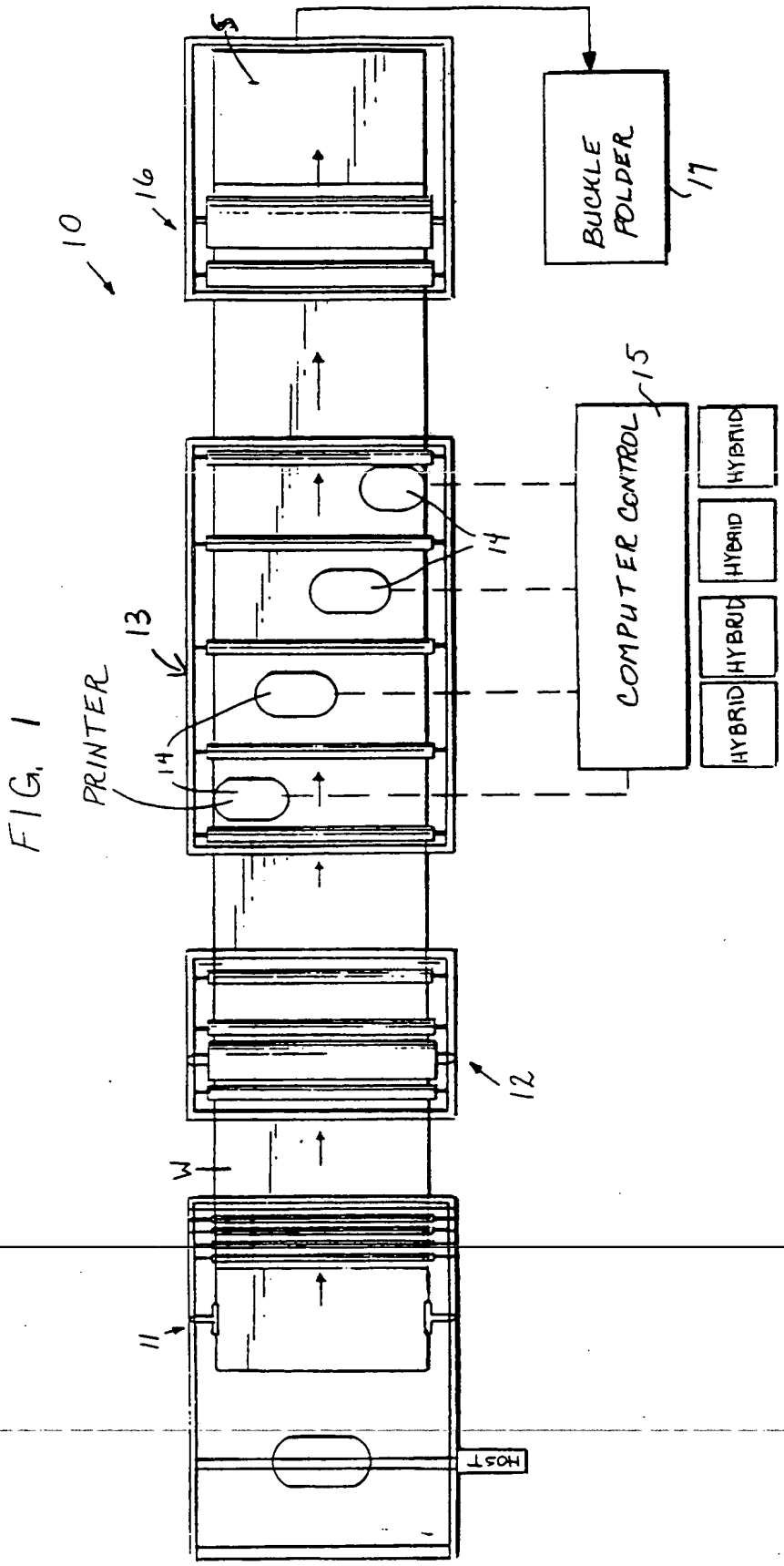

BUCKLE FOLDER
17
16
10
5
COMPUTER CONTROL
15
HYBRID
HYBRID
HYBRID
HYBRID
14
13
PRINTER
14
12
W
11
HOST

FIG. 1

FIG. 2

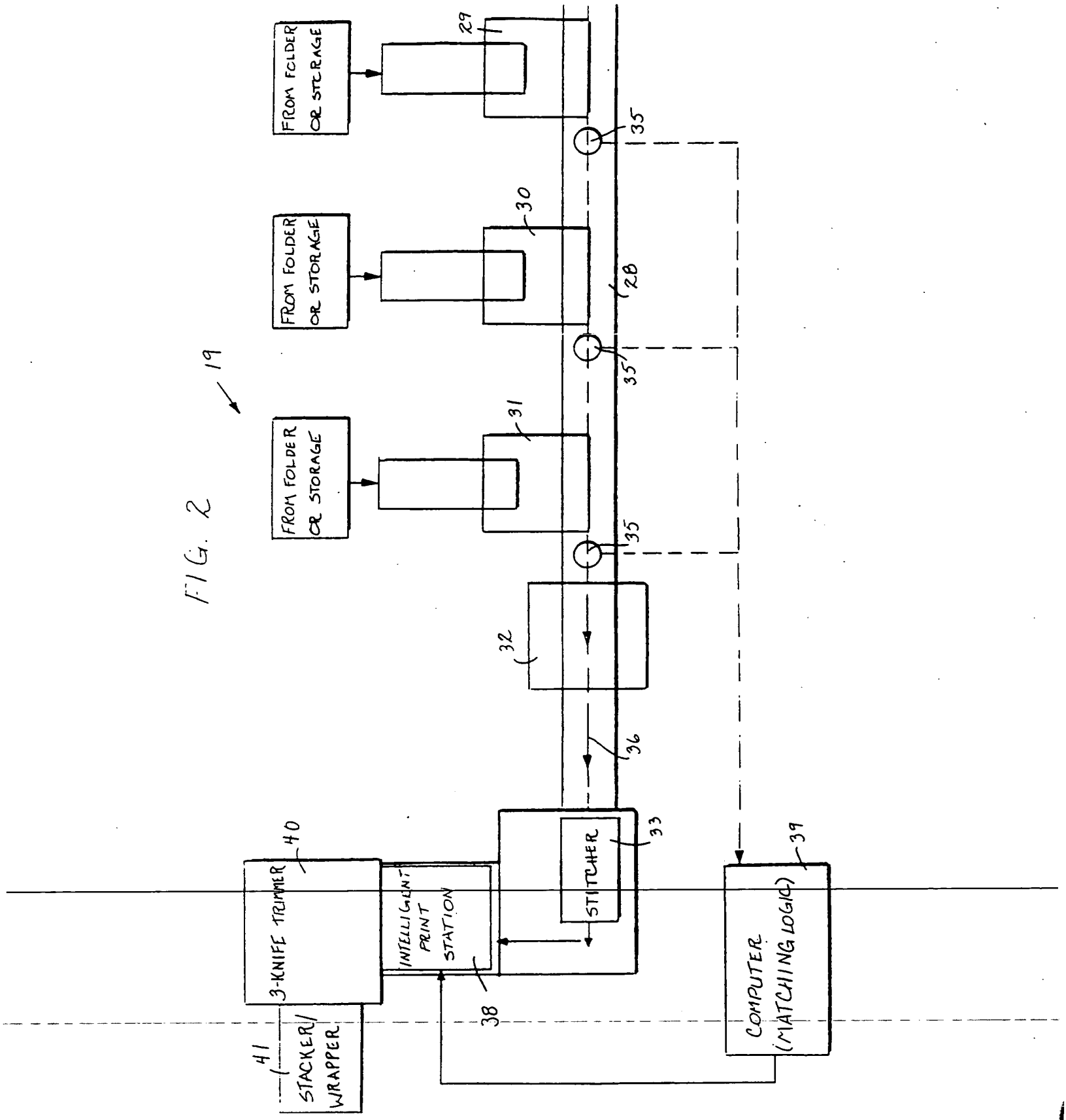

19
FROM FOLDER OR STORAGE
29
30
31
35
28
32
36
33
STITCHER
40
3-KNIFE TRIMMER
INTELLIGENT PRINT STATION
38
41
STACKER/ WRAPPER
39
COMPUTER (MATCHING LOGIC)

FIG. 3

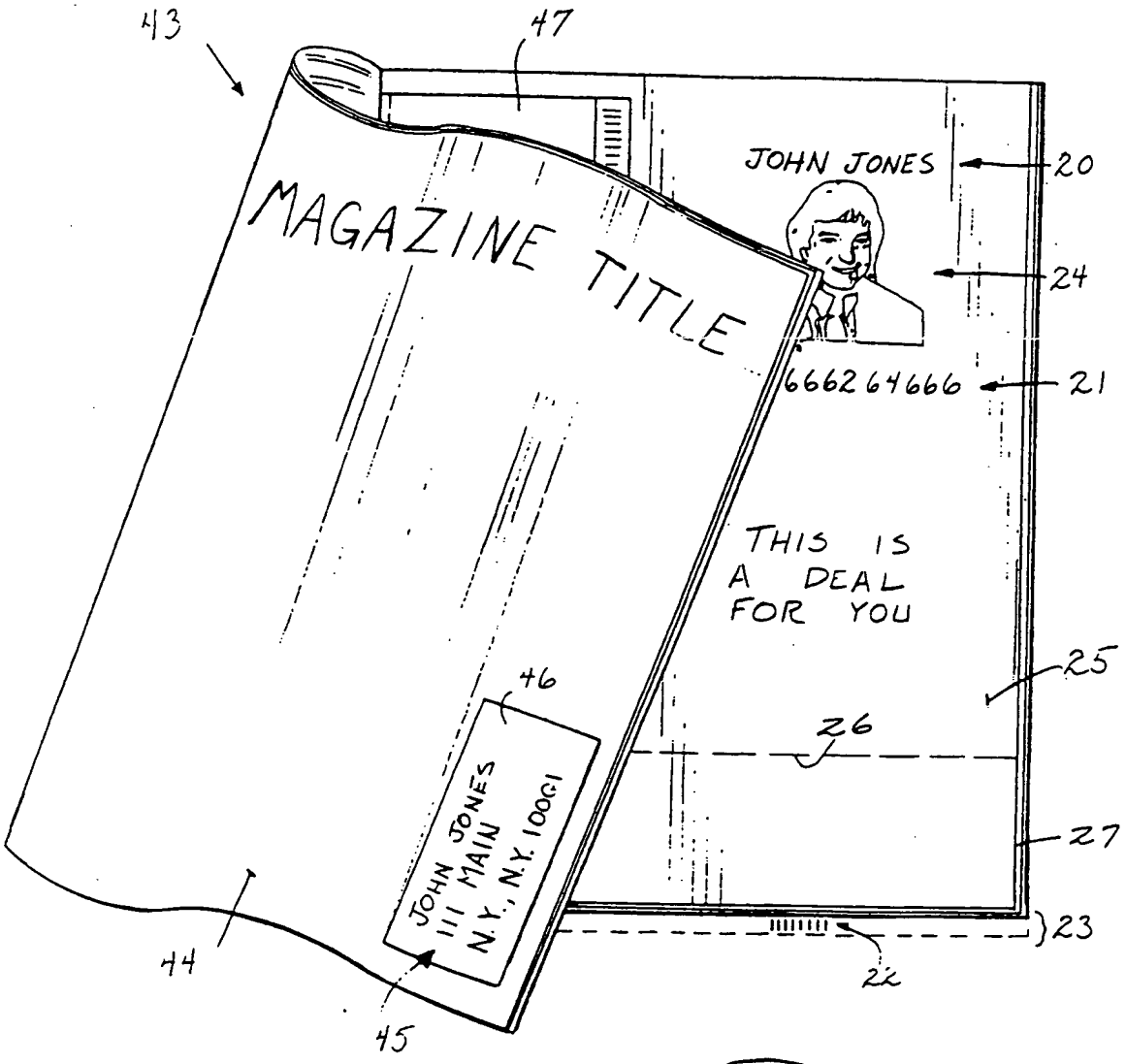

43
47
MAGAZINE TITLE
JOHN JONES
20
24
6662 64666
21
THIS IS
A DEAL
FOR YOU
25
46
26
27
23
JOHN JONES
111 MAIN
N.Y., N.Y. 10001
44
45
22

FIG. 4

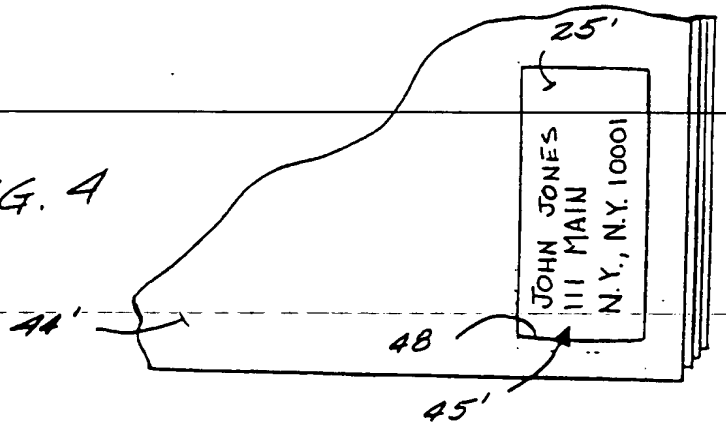

25'
JOHN JONES
111 MAIN
N.Y., N.Y. 10001
44'
48
45'

FIG. 5

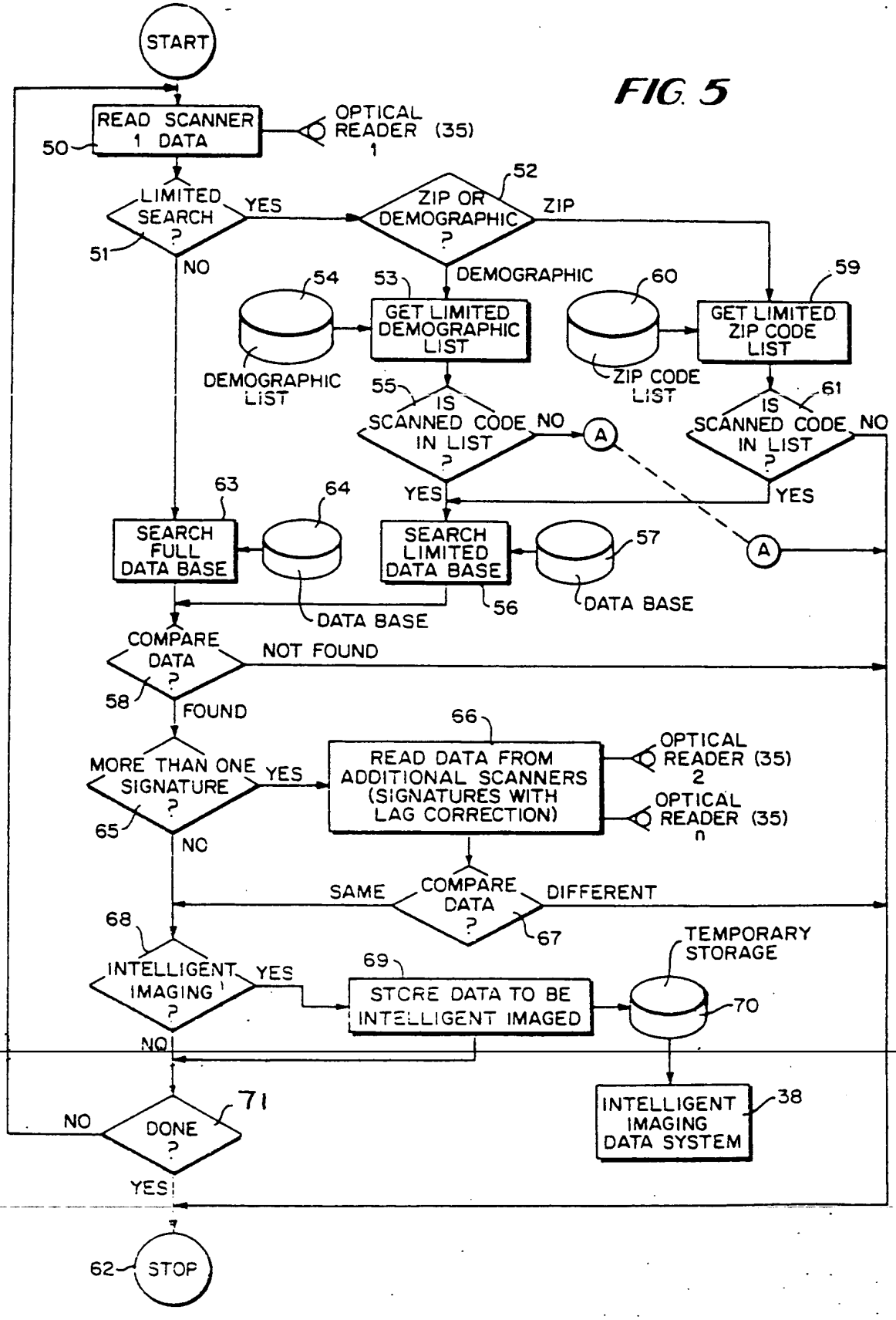
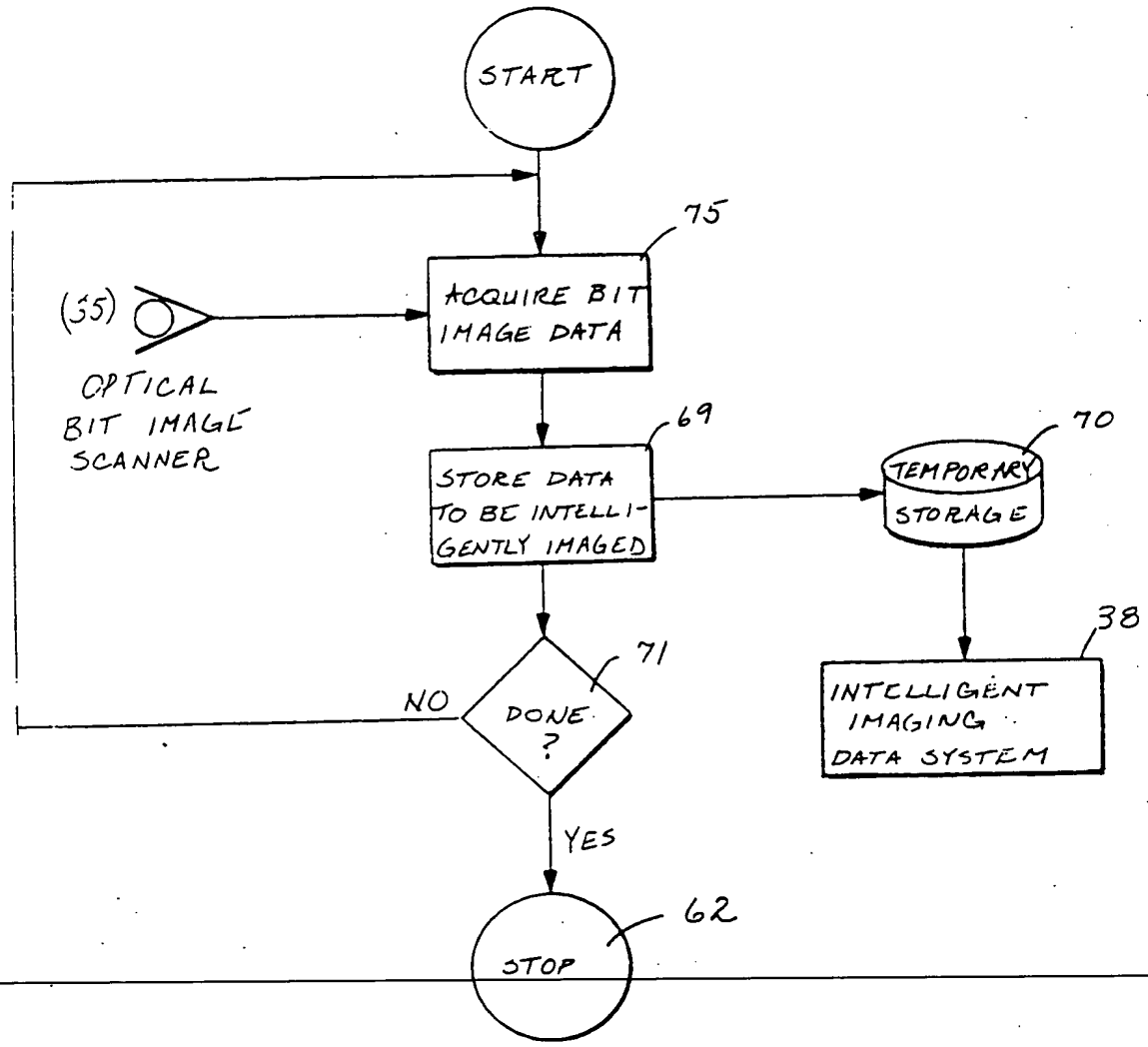

START
READ SCANNER 1 DATA
50
OPTICAL READER (35) 1
LIMITED SEARCH ?
51
YES
NO
ZIP OR DEMOGRAPHIC ?
52
ZIP
DEMOGRAPHIC
54
53
GET LIMITED DEMOGRAPHIC LIST
DEMOGRAPHIC LIST
60
59
GET LIMITED ZIP CODE LIST
ZIP CODE LIST
55
IS SCANNED CODE IN LIST ?
NO
A
61
IS SCANNED CODE IN LIST ?
NO
YES
YES
63
64
SEARCH FULL DATA BASE
DATA BASE
SEARCH LIMITED DATA BASE
57
56
DATA BASE
A
COMPARE DATA ?
58
NOT FOUND
FOUND
66
MORE THAN ONE SIGNATURE ?
65
YES
READ DATA FROM ADDITIONAL SCANNERS (SIGNATURES WITH LAG CORRECTION)
OPTICAL READER (35) 2
OPTICAL READER (35) n
NO
SAME
COMPARE DATA ?
67
DIFFERENT
68
INTELLIGENT IMAGING ?
YES
69
STORE DATA TO BE INTELLIGENT IMAGED
TEMPORARY STORAGE
70
NO
NO
DONE ?
71
INTELLIGENT IMAGING DATA SYSTEM
38
YES
62
STOP

FIG. 6


START
75
ACQUIRE BIT IMAGE DATA
(55)
OPTICAL BIT IMAGE SCANNER
69
STORE DATA TO BE INTELLIGENTLY IMAGED
70
TEMPORARY STORAGE
38
INTELLIGENT IMAGING DATA SYSTEM
71
DONE ?
NO
YES
62
STOP